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INTERGOVERNMENTAL NEGOTIATING COMMITTEE FOR
A FRAMEWORK CONVENTION ON CLIMATE CHANGE

EXECUTIVE SUMMARY OF THE NATIONAL COMMUNICATION OF

SWITZERLAND

submitted under articles 4 and 12 of the
United Nations Framework Convention on Climate Change

In accordance with decision 9/2 of the Committee, the interim secretariat is to make available, in the official languages of the United Nations, the executive summaries of the national communications submitted by Annex I Parties.

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Copies of the Swiss national communication can be obtained from:

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SWITZERLAND

Introduction

1. By signing and ratifying the United Nations Framework Convention of 9 May 1992 on climate change, Switzerland recognized that today our planet is exposed to certain climatic changes. These differ from those of the past - both in their scale and in the speed with which they occur - and could be a cause of global warming. Switzerland had declared its readiness to support the Convention fully. Consequently, our country has committed itself to preparing a report on Swiss policy in the field of climate change.

2. Under article 12 of the Convention, Switzerland must draw up a current inventory of emissions of greenhouse gases and provide a periodic report on policies and measures introduced. The deadline laid down for the first report stands at six months after the entry into force of the Convention on 21 March 1994, that is, on 21 September 1994.

Inventory of greenhouse gases in Switzerland

3. The Swiss inventory is based on 1990 data and covers the following greenhouse gases:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Precursors of tropospheric ozone (O_3): nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO).

4. Emissions of CO_2 make by far the largest contribution (79 per cent) to the greenhouse effect (see table S-1).

Carbon dioxide (CO_2)

5. In all, 94 per cent of CO_2 emissions are energy-related, while 6 per cent of CO_2 emissions are not energy-related, deriving principally from cement production. Since the baseline data are detailed and comprehensive, the data obtained are of high quality. Sinks for CO_2 are natural CO_2 fixation processes such as growth in forests and peat bogs.

Table S-1: Inventory of CO_2 in Switzerland by sources, 1990

CO_2 emission sources and sinks (1990) (millions of tonnes)	Mt CO_2
Energy-related emissions (combustion):	**42.9**
- Energy conversion	1.3
- Industry	5.7
- Transport	17.4
- Services	6.5
- Residential	11.6
- Other (waste incineration)	0.4
Industrial production	**2.1**
Wastes	**0.7**
Total emissions	**45.7**
CO_2 sinks	**-5.2**
- Forestry/reafforestation/land use	
Total CO_2	**40.5**

6. Comments on sources and sinks:

- Energy-related CO_2 emissions were calculated using the corresponding emission factors, applied to data on Swiss energy consumption.

- Industry-related emissions: data on cement production.

- Agriculture: it is recognized that CO_2 "consumption" in the form of plant photosynthesis is roughly in balance with agricultural CO_2 "production" through respiration (by livestock) and decomposition of organic matter.

- Forestry/land use: these are CO_2 sinks. CO_2 "consumption" is markedly higher than "production" (tree growth, increase in the mass of peat in primary high-altitude peat bogs, etc.).

Methane (CH_4)

7. First and foremost, methane is released by commercial animals (50 per cent) and storage of farm manure (28 per cent) in agriculture, as well as decomposition of organic matter contained in wastes (waste dumps, 17 per cent). The data are of average quality; new figures will be available in 1995.

Table S-2: Inventory of CH_4 in Switzerland by source, 1990

Sources of emissions of CH_4 (1990)	100 t of CH_4
Energy (combustion):	11
- Transport	2
- Gas transmission (losses)	9
Agriculture:	215
- Stockraising	138
- Farm manure	77
Waste:	48
- Waste dumps	46
- Sewage treatment	2
Total CH_4	274

Nitrous oxide (N_2O)

8. The bulk of emissions of nitrous oxide (93 per cent) originates from the use of fertilizers in agriculture. Combustion of fossil energy sources (5 per cent) and industrial processes (2 per cent) make only a relatively small contribution to total N_2O emissions.

9. The data are of poor quality. Here too, new figures will be available only in 1995.

Table S-3: Inventory of N_2O in Switzerland by source, 1990

Sources of emissions of N_2O (1990)	100 t of N_2O
Energy (combustion)	1.5
- Transport	0.8
- Other areas (heating)	0.7
Industrial production	0.4
Agriculture (manure spreading)	26.7
Total N_2O	29

Precursors

10. Nitrogen oxides (NO_x), volatile organic compounds (VOC) and carbon monoxide (CO) are precursors of tropospheric ozone (O_3).

11. Emissions of precursors originate from many sources:

- Transport (energy, combustion, losses)
- Residential (energy, wastes)
- Croft industry, services, agriculture (energy, wastes)
- Industry (energy, production, wastes).

12. In this area, the data are of average to good quality. Updated figures are being prepared.

Table S-4: Inventory of precursors in Switzerland, 1990

Emission sources (1990)	100 t of NO_x	100 t of CO	100 t of VOC
Energy:			
- Combustion	151	375	76
- Losses			14
Industrial production	29	52	26
Solvents			180
Wastes	4	4	1
Total	**184**	**430**	**297**

Overall view

13. Figure S-1 presents the greenhouse gas budget in Switzerland. The emission values are given by multiplying amounts of gasses emitted by the global warming potential (GWP) of the various gasses. The values given are those supplied by IPCC.

Measures decided on

Climate in Swiss policy

14. Switzerland has no independent climate policy. Instead, the measures introduced for the purpose of mitigating climate changes are components emanating from different political areas, particularly:

- environment policy (especially protection of air quality),
- energy policy and transport policy,
- farm policy and forestry policy.

15. In these areas, a number of measures with impacts on greenhouse gas emissions have already been introduced and are being implemented, or else are at the preparatory stage (in the Federal Council, the administration or the Parliament).

Measures designed to reduce greenhouse gas emissions

16. The tables below indicate, for the principal areas, measures already introduced for the purpose of reducing greenhouse gas emissions (see tables S-5, S-6 and S-7 at the end of this paper).

Research and observation

17. In Switzerland, research on climate has been undertaken in the following areas: climate trends, air quality protection, transport and energy, farming and forestry. In addition, a number of institutes participate in the worldwide programme known as Global Atmosphere Watch (GAW).

18. Swiss research on climate trends covers the following areas of activity:

- processes governing the climate system,
- climate monitoring and observation,
- climate modelling,
- investigation of greenhouse gas sources and sinks,
- study of the impacts of climate change on ecosystems,
- socio-economic aspects (including implications),
- measures to address the situation.

19. Almost two thirds of the projects relate to the first two areas. Public investment in research on climate trends currently stands at around 29 million francs a year.

20. Photo-oxydants constitute the main avenue of applied research in the area of air quality protection.

21. Energy-related research in the public sector (223 million francs in 1993) highlights renewable sources of energy, the rational use of energy and clean and efficient combustion. In the field of transport, the national research programme on environment and transport covers subjects related to climate change. Switzerland also participates in many international projects.

22. The impacts of climate change on agriculture and forestry are studied under the national research programme on climatic change and natural disasters, and as a part of the priority programme on environmental technology and environmental research.

Information and communication

23. Following the Rio Summit in 1992, the Federal Office for the Environment, Forests and Landscape, as well as environmental protection organizations such as WWF and Greenpeace, launched several information campaigns on the subject of climate. The Energy 2000 programme also includes various information campaigns dealing with the rational and environmentally friendly use of energy and renewable sources of energy.

Emission scenarios, 1990-2000

24. The scenarios take into consideration the measures set out in chapter 3.

CO_2 emission scenarios for the year 2000

25. The new scenarios show that the objectives regarding emissions (stabiliztion of CO_2 emissions at the 1990 level) can be reached by the year 2000. However, in order for this to be done efforts must be pursued at all levels, planned measures must be put into effect without delay and economic conditions must evolve as expected. It was principally the 1991-1993 recession which led to the fall compared with earlier scenarios (the March 1994 report on the carbon tax).

26. For the period 1990-2000, CO_2 emissions are expected to change as follows:

Table S-8: CO_2 emissions, 1990-2000

CO_2 (millions of tons)	**1990 1/**	**2000**	**Change (%)**
Energy 2/	44.7	43.2	-3.4
Industrial production	2.1	2.3	+10
Wastes	0.7	0.8	+14
Change in land use/forestry	-5.2	-5.3	-2
Total	**42.3**	**41.0**	**-3.1**

1/ Model-based value, corrected for climate.

2/ Including waste incineration.

Scenarios for emissions of other greenhouse gases for the year 2000

Methane CH_4

27. These scenarios are based on earlier data. The base lines are in the process of revision. The data are of medium quality.

Table S-9: CH_4 emissions, 1990-2000

CH_4 (1,000 t)	1990	2000	Change (%)
Energy:			
- transport	2.3	1.7	-26
- gas leakages	8.7	10.0	+15
Industrial production	1/	1/	
Solvents	0	0	0
Agriculture	215	203 2/	-6 2/
Wastes	48	41	-15
Total	274	256	-7

1/ Industrial production: included elsewhere.

2/ Reduction achieved in 1993.

Nitrous oxide N_2O

28. Only quantitative data for the transport sector are available for nitrous oxide emissions in the year 2000. These are likely to rise from 850 t in 1990 to around 1,500 t in the year 2000. This corresponds to an increase of around 75 per cent.

Precursors

29. The forecasts for precursors are also based on earlier data. In addition, the energy consumption underlying these data does not precisely correspond to current consumption forecasts. These figures should therefore be regarded as being of medium quality.

Table S-10: Emissions of NO_x, CO and VOC, 1990-2000

NO_x (1,000 t)	1990	2000	Change (%)
Energy	151.0	73.4	-51
Industrial production	25.5	21.8	-24
Solvents	0	0	0
Agriculture 1/	0	0	0
Wastes	4.5	4.3	-4
Total	184	100	-46

CO (1,000 t)	1990	2000	Change (%)
Energy	374.8	214.8	-43
Industrial production	51.7	53.6	+4
Solvents	0	0	0
Agriculture 1/	0	0	0
Wastes 1/	4.0	4.7	+18
Total	430	273	-37

VOC (1,000 t)	1990	2000	Change (%)
Energy	90.1	47.5	-47
Industrial production	26.0	15.6	-40
Solvents	180.0	178.8	-1
Agriculture 1/	0	0	0
Wastes 1/	0.9	1.0	+11
Total	297	243	-18

1/ Incomplete.

Long-term CO_2 emission trends

30. Under the latest scenarios, energy-related CO_2 emissions are likely to fall by at least 3 per cent during the period 1990-2000, provided that all steps that have been decided upon are strictly and immediately applied. However, from the year 2000 onwards the level of emissions will rise again. In the year 2030, the level is likely to stand some 5 per cent above the 1990 level.

Table S-11: Energy-related CO_2 emissions, 1990-2030, taking into account measures already decided upon

CO_2 (millions of tons)	1990 1/	2000	2030	Change 1990-2030 (%)
Residential	12.9	12.2	10.6	-18
Services, agriculture	5.2	4.7	3.8	-2
Industry	7.2	5.3	6.0	-17
Transport	17.6	19.0	23.2	+32
Processing industries	1.4	1.6	2.6	+86
Total 2/	44.3	42.8	46.3	+5

1/ Including correction for climate.

2/ Excluding emissions from household waste incineration plants.

31. The survey shows that large-scale action will become necessary in the long term. Efforts to promote energy savings must be rapidly strengthened and stepped up, to prevent energy-related CO_2 emissions from resuming their rise after the year 2000. Application of the future energy legislation and the carbon tax, currently at the project stage, will make it possible to reduce demand for fossil energy sources and CO_2 emissions (see chap. 6).

International cooperation

32. Switzerland's contributions fall into the following framework:

- contribution to the Global Environment Facility;
- bilateral technical cooperation;
- cooperation in the field of technology transfer.

33. There are essentially three major appropriations available for funding international cooperation:

- a major appropriation of 300 million francs to fund environmental programmes and projects of global importance in developing countries;
- two major appropriations amounting to a total of 1,650 million francs for bilateral cooperation with the countries of Central and Eastern Europe and CIS (the Commonwealth of Independent States).

34. Current appropriations for development assistance also allow for the funding of a number of climate-related projects.

35. The appropriation of 300 million francs enabled Switzerland to play an important role in GEF and to finance 13 projects in 9 countries relating to climate aspects as a part of bilateral technical cooperation.

36. The funds available under the two other major appropriations referred to above are split between financial assistance (financing of investment projects) and appropriations for bilateral technical cooperation (advisory services and training). A portion of these resources is invested in projects relating to energy, environmental protection and climate change.

37. In the field of the transfer of technologies to developing countries, Switzerland plays a largely catalytic role between private investors and potential target countries for transfers of capital and know-how.

Measures envisaged

38. In order to achieve a lasting reduction in greenhouse gases in the long term, Switzerland envisages a number of measures with a focus on economic instruments:

- carbon tax: an incentive tax on all fossil energy sources, part of it to be refunded to the people. The rate of the tax will be increased in steps;

- energy legislation: the 1990 order on energy use, which is currently in force but has a restricted timeframe, must be supplemented and converted into federal legislation. This legislation and the carbon tax should be regarded as forming a whole;

- VOC tax: with the revision of the environmental protection legislation, the Federal Council plans to introduce a tax on volatile hydrocarbons. As in the case of the carbon tax, this incentive tax would be introduced step by step.

39. Several other measures are under discussion, principally in the transport field. They should also have a positive impact on climate. They include the introduction of a tax on lorry traffic, based on the services provided, the transfer of trans-Alpine goods traffic from roads to railways and the strengthening of motor vehicle exhaust gas regulations in coordination with the European Union.

40. The consistent application of the measures which have been decided upon and the introduction of the measures which are envisaged are of major importance for Swiss policy as regards climate change.

Figure 3-1: Greenhouse gas budget in Switzerland, 1990 measured using GWPs

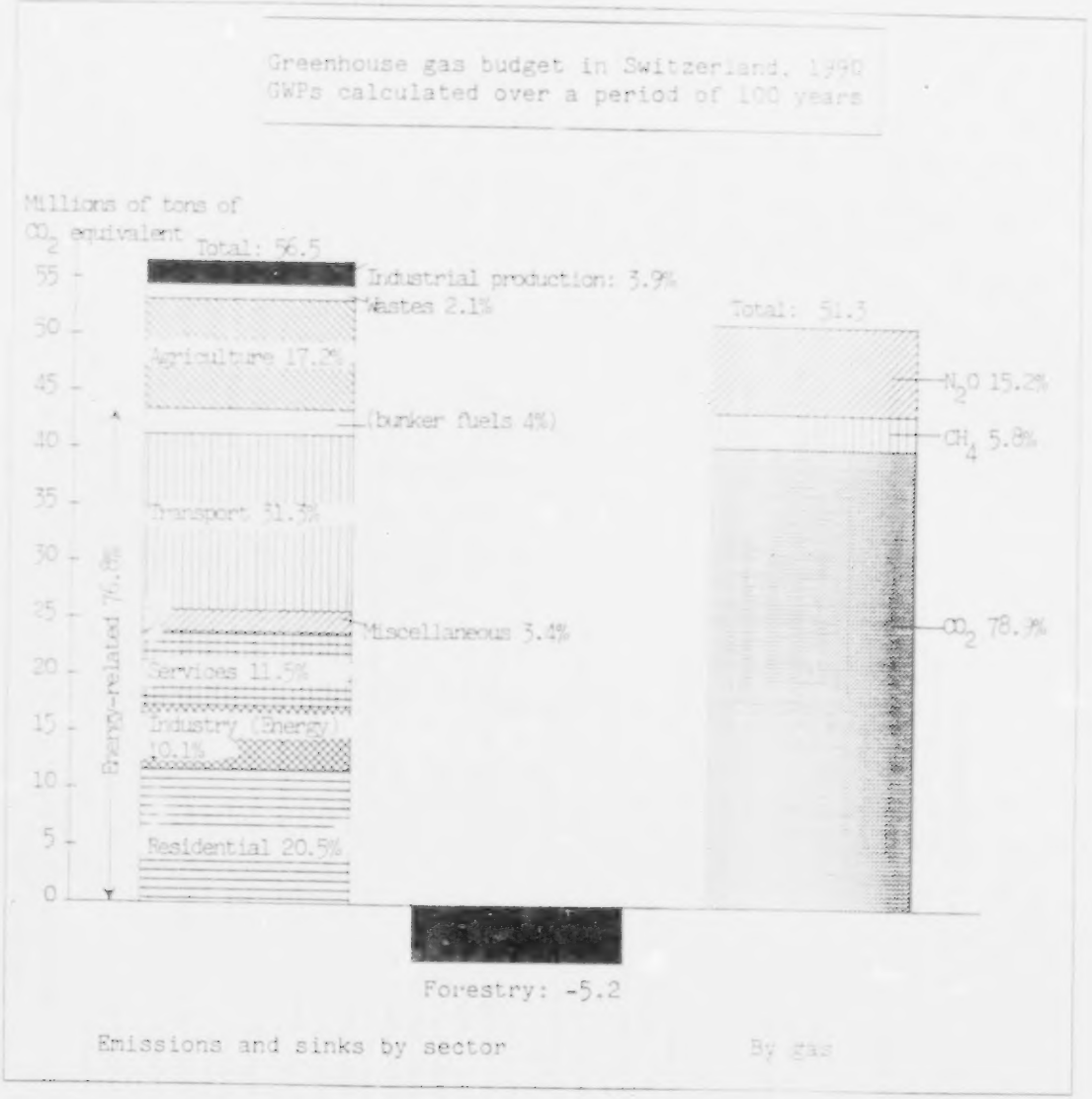

Table S-5: Measures decided upon in the energy and industry sector

Measures	Aims/target groups	Relevant greenhouse gases	Types of instrument	Legal status	Concrete action	Relevance to climate
Declarations for energy-using installations, motor vehicles and equipment	Information; households, craft industries and services, agriculture	CO_2, CO, NO_x	Voluntary agreement with regulations for implementation (as subsidiary measure)	Energy use order (AUE) of 14.12.1990, Energy use ordinance (OUE) of 22.1.1992	Indication of energy consumption	Medium
Ceilings/target values for new buildings and conversions	Reduction of energy needed for heating; private households, craft industries and services, agriculture	CO_2, CO, NO_x	Certification	AUE/OUE, ordinance on air quality protection (OPair)	Identification of specific heating needs and target energy values	High
Individual metering for heating and hot water	Energy consumption; households, services	CO_2, CO, NO_x	Regulation	AUE/OUE, cantonal legislation	Construction of 5 flats or more, new buildings from 1992, existing buildings from 1988	High
Ceilings for consumption/losses for heating installations, including standby position	Reduction of emissions from these sources; households, craft industries and services	CO_2, CO, NO_x	Certification	OPair, cantonal legislation	Regulations for oil-fired, coal-fired or gas-fired heating systems	High
Emission ceilings for heating installations	Reduction of emissions from these sources; industrial installations	CO_2, CO, NO_x, VOC	Certification	OPair, cantonal legislation	Regulation for oil-fired, coal-fired or gas-fired heating systems	High
Support for recovery of heat losses	Recovery of heat losses; all fields	CO_2, CO, NO_x	Financial incentives	AUE/OUE, cantonal legislation	Financial contributions, information campaigns	Medium
Support for renewable energy sources	Rational use of renewable energy; all fields	CO_2, CO	Financial indications	AUE/OUE, cantonal legislation	Financial contributions, information campaigns	Medium
Waste treatment	Waste suitable for incineration	CH_4	Regulation	Waste treatment ordinance (OTD) of 10 December 1991	Obligation to burn waste in appropriate installations	Medium

Table S-6: Measures decided upon in the transport sector

Measures	Aims/target groups	Relevant greenhouse gases	Types of instrument	Legal status	Concrete action	Relevance to climate
Raising of customs duty on fuels	Reduction of fuel consumption, road traffic	CO_2, CO, NO_x, VOC	Fiscal incentive	Federal order of 7 March 1993	Increase of 20 centimes per litre	High
Regulations relating to motor vehicle exhaust gases	Reduction of emissions from these sources, road traffic	CO, NO_x, VOC	Regulation	Regulation on exhaust gases	Private cars, lorries, mopeds, motorcycles	High
Fuel consumption targets for vehicles	Reduction of fuel consumption by vehicles, road traffic	CO_2, CO, NO_x	Voluntary agreement/regulation	AUE/OUE	Ordinance on target values	Medium
Speed limits on major roads and outside built-up areas	Reduction of traffic speeds	CO, NO_x, VOC (CO_2)	Regulation	Road Traffic Act revised on 15.3.1992	Powers transferred from the central Government to the cantons	Low
Monitoring of diesel vehicle exhaust gases	Reduction of emissions from diesel vehicles	CO, NO_x, VOC	Regulation	Ordinance of 23.12.1993	Obligatory checks every two years	Medium
Measures to protect air quality in cantons and communes	Reduction of immissions, road traffic (public transport)	CO, NO_x, VOC (CO_2)	Various regulations, voluntary agreements	Ordinance on air quality protection, plan of measures	Car park policy, auxiliary measures for public transport, reduction of speeds in neighbourhoods, provision of vapour recovery equipment at petrol stations	Medium

Table S-7: Measures decided upon in the farming sector

Measures	Aims/target groups	Relevant greenhouse gases	Types of instrument	Legal status	Concrete action	Relevance to climate
Dairy quotas	Stabilization of production	CH_4, N_2O	Regulation	Dairy industry order, revised on 1.11.1989	The central Government sets individual quotas	Medium
Protection of water quality in agriculture	Reduction of the use of fertilizer: checking of livestock	CH_4, N_2O	Regulation	Water Quality Protection Act of 24.1.1991	Manuring limit equivalent to 3 livestock units per hectare	High
Encouragement of fallow	Reduction of livestock numbers	CH_4, N_2O	Fiscal incentives, promotion campaign	Water Quality Protection Act of 24.1.1991	Information in the field of livestock raising	Medium
Incentives in the field of seeds	Stabilization of grain production	N_2O, CH_4, CO_2	Fiscal incentive	Seed production ordinance of 2.12.1991	Subsidies	Low
Monitoring of environmentally harmful substances in farming	Reduction of harmful substances in fertilizers	N_2O, CH_4	Regulation	Environmentally dangerous substances ordinance of 16.9.1993	Regulation for nutritional balance	Low
Direct payments for specific environmental benefits	Financial incentive for integrated production or organic farming	N_2O	Fiscal incentive	Farming Act, art. 31 (b) and guidelines	Different lines of production (fruit production, use of fertilizers, herbicides, etc.)	Medium